



Hardwickia binata Roxb

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Published in:
Seed Leaflet

Publication date:
2011

Document version
Publisher's PDF, also known as Version of record

Citation for published version (APA):
Kundu, M., & Schmidt, L. H. (Ed.) (2011). *Hardwickia binata* Roxb. *Seed Leaflet*, (152).

Hardwickia binata Roxb.

Taxonomy and nomenclature

Species name: *Hardwickia binata* Roxb.

Family: Fabaceae - Caesalpinioideae

Synonym(s)

Hardwickia trapeziformis R. Grah., *Harongana madagascariensis* Choisy

Vernacular/Common names:

Anjan (Hindi), papri (Nepali), anjan (Trade name)

Distribution and habitat

Hardwickia binata is a native species of tropical south – SE Asia. It is distributed from Afghanistan in the west through Pakistan, Iran, India, Nepal, Bangladesh, Cambodia, Laos, Thailand, Vietnam, Myanmar, to Malaysia, Philippines, Brunei, Indonesia and Papua New Guinea in the west. It grows in dry and hot climate, characterised by a long period of drought, low to moderate rainfall and intense heat during summer season. In the cold season moderate frost may occur in its area of distribution particularly in low-lying areas. The maximum temperature in its habitat varies from 43-47°C and minimum 1-10°C, the average being 22-34°C. It is sensitive to frost when young but grows more frost hardy with age. Young shoots sensitive to fire but recovery is good. The normal rainfall varies from 250-1000 mm. It thrives best in areas receiving a rainfall of 500 to 1000 mm. The tree occurs up to an altitude of 760 masl. It can grow on a wide variety of geographical formations and soils such as dry shallow soil and rocky ground, porous sandy-loams and reddish gravelly sand sandstones, conglomerates, granites and schist.

Uses

H. binata yields an extremely hard, heavy and durable timber. The wood is largely used for beams and mine props, bridge and house construction, agricultural implements, carts and wooden wheels and railway sleepers. Leaves are used as cattle fodder, containing about 9-11% crude protein. The species is regarded promising for fodder production in arid zone areas and also for excellent firewood and good charcoal. The bark yields a red-brown fibre used for well ropes and other agricultural purposes. Leaves are used as manures.

Botanical description

H. binata is a deciduous, moderate to large-sized tree, up to 36 m height and 4 m in girth with a clear cylindrical bole of up to 12-15 m. Bark of saplings almost silvery white and smooth, gradually changing as the tree gets older to dark grey and rough with irregular vertical cracks, 1.2-2.5 cm thick, exfoliating in narrow flakes. Leaves alternate, bifoliate resembling Bauhinias. Leaflet pairs with a minute bristle in between. Leaflets are 2-6 cm long and 2-3 cm wide, almost kidney shaped and grayish green in color, sessile, entire, obliquely ovate and coriaceous. Flowers are small, yellowish green in axillary and terminal lax panicked racemes.



Hardwickia binata Roxb.

Fruit and seed description

Fruit: The fruit is a flat, samaroid pod, 5-7.6 cm long and 1-1.5 cm wide, oblong lanceolate, coriaceous, narrowed at both ends, with parallel longitudinal veins, containing one seed near the apex. About 3880 fruits weigh 1 kg.

Seed: The seed is flat, about 2 cm long and 0.75 cm wide, straight to slightly bended pointed at one end and rounded at the other, with a fairly hard testa. Number of seeds per kg is 4800-5200.

Flowering and fruiting habit

The flowers appear from July to September. The pods develop rapidly, reaching full size in November and ripening in April or May. The light winged pods start falling in May, but most of them are blown by the strong wind currents. The pods dehisce at the apex after they reach the ground. The tree produces seeds periodically to some extent every year but gregarious seeding takes place on an average after every three to five years depending upon the locality. In the same year, good seeding may take place in one locality but not in the other. The profuse seeding is suspected induced by a period of drought. Trees raised from seedlings begin to seed in 20-25 years. Coppice shoots may bear seed as young as 7 years.

Seed collection

The light-winged pods are best collected from the tree, since fallen pods are often damaged by insects or rodents. The easiest way of collection is to spread a tarpaulin under the tree and collect the pods by shaking the trees or lopping the branches or plucking the pods. The optimum period for collection is when the colour of the pods turns brown with the moisture content of about 10-12 %. As the seeds are liable to be eaten by birds, not fully mature yellowish brown coloured pods may be collected and after-ripened by drying in shade with proper aeration by spreading in one layer on cement floor or table-top till the moisture content has lowered to 4-6 %.



Seed pod and seeds of *H. binata*

Processing and handling

After collection pods are sorted according to their maturity (colour). Underdeveloped and small fruits are discarded. The fully matured pods may be dried placing them under sun for extraction of seeds. Seeds are then cleaned by seed blower or by winnowing.

Storage and viability

Seeds of *H. binata* can tolerate 4-5% moisture content; hence the seeds are of orthodox type. The seeds can be stored for long period (more than 5 years) if stored at freezing temperature (0 to -20°C). Even the seed is capable of retaining its viability at ambient temperature (annual variation in temperature 15-46°C; it was

observed that viability was not reduced after two years of storage at room temperature with 10% moisture content of seed.

Dormancy and pretreatment

Dormancy is not noted and pretreatment is not required for fresh seeds. However, germination can be hastened by soaking seeds in water prior to sowing.

Sowing and germination

H. binata has been propagated artificially both in and out of its natural habitat, partly by direct sowing and partly by transplanting seedlings, though it is generally agreed that the former is the more successful method. Seeds may start germinating in 10-15 days and take about five weeks to complete. Soaking of seeds in cold water for 24 hours prior to sowing gives satisfactory results. Germination is epigeous. Seeds should be covered lightly. Shading of nursery beds is necessary as exposure of tiny seedlings to hot sun results in large scale mortality in the dry localities. Growth and survival of seedlings are improved by mulching and shade.

Phytosanitary problems

Longicorn beetle, *Aeolesthes holosericea* attacks stumps and felled timber. Prophylactic measures against borer attack in freshly felled timber in storage for longer period may be adopted. Larvae of *Enarmonia palamedes* defoliate and feed on flowers and seed. Larvae of *Pachymerus gonagra* bore into the seed.

Selected readings

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